REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-24 are pending in the present application. Claims 1 and 13 have been amended by the present amendment.

In the outstanding Office Action, Claims 4, 5, 7-10, 16, 17 and 19-22 were withdrawn from further consideration; Claims 1, 2, 3, 11, 13, 14, 15 and 23 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al in view of Katoh; and Claims 6, 12, 18 and 24 were rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al and Katoh in view of Nanbu.

Formal drawings are being submitted as requested in the outstanding Office Action.

Claims 1, 2, 3, 11, 13, 14, 15 and 23 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Rosencher et al in view of Katoh. This rejection is respectfully traversed.

The outstanding Office Action states at page 7, item 8, the term "about" broadens the scope of the definition of "an order of magnitude" feature recited in Claim 1. Accordingly, independent Claims 1 and 13 have been amended to recite that a thickness of the transfer barrier layer is at least one order of magnitude greater than a thickness of the quantum well.

As acknowledged in the outstanding Office Action at page 7, item 8, Rosencher et al do not teach or suggest this feature. In addition, Rosencher et al disclose two coupled asymmetrical quantum wells (Column 5, line 63-35 and Figure 7), a first quantum well 3 having a thickness equal to 7nm, an internal barrier 4 with a thickness equal to 20nm and a second quantum well 5 with a thickness equal to 5nm. Thus, Rosencher et al do not teach or suggest the thickness of the transfer barrier layer at least one order of magnitude greater than the thickness of the quantum well. Further, Katoh also does not teach or suggest this feature.

Therefore, it is respectfully submitted independent Claims 1 and 13 and each of the claims depending therefrom are allowable.

Claims 6, 12, 18 and 24 stand rejected under 35 U.S.C. §103(a) as unpatentable over Rosencher et al and Katoh in view of Nanbu. This rejection is respectfully traversed.

Claims 6 and 12 depend on independent Claim 1 and Claims 18 and 24 depend on independent Claim 13, which as discussed above are believed to be allowable. Further, Nambu also does not disclose a transfer barrier layer having a thickness one order of magnitude larger than a thickness of a quantum well. Accordingly, it is respectfully requested this rejection also be withdrawn.

In addition, regarding the withdrawal of Claims 4, 5, 7-10, 16, 17 and 19-22, it is noted these claims depend on Claims 1 and 13, and accordingly, should be rejoined.

Further, it is respectfully requested this amendment be entered as it is believed no new issues have been raised.

Consequently, in light of the above discussion in view of the present amendment, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Gregory J. Maier
Attorney of Record
Registration No. 25,599
David A. Bilodeau
Registration No. 42,325

22850

(703) 413-3000
Fax #: (703)413-2220
GJM/DAB/RFF/abs
I:\atty\Rff\0154\01542811\01542811.amd af2.wpd

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IN THE CLAIMS

Please amend Claims 1 and 13 as follows:

1. (Twice Amended) An electromagnetic wave detector comprising:

a stack of layers made of III-V semiconductor materials, a conduction band profile of said materials defining at least one quantum well, said quantum well having at least one first discrete energy level populated with electrons that are capable of passing to a second energy level under an absorption of an electromagnetic wave; and

means for counting said electrons in the second energy level,

wherein the stack of layers of semiconductor materials furthermore comprises a transfer barrier layer, and an electron storage layer separated from the quantum well by the transfer barrier layer, and

wherein a thickness of the transfer barrier layer is [about] at least one order of magnitude greater than a thickness of the quantum well, a lowest energy level of a conduction band of the transfer barrier layer is greater than energy levels of the quantum well and the electron storage layer, and the conduction band profile of the stack of layers of semiconductor materials decreases from the quantum well to the electron storage layer so as to further a flow of electrons from the second energy level to the electron storage layer.

13. (Amended) An electromagnetic wave detector comprising:

a stack of layers made of III-V semiconductor materials, a conduction band profile of said materials defining at least one quantum well, said quantum well having at least one first discrete energy level populated with electrons that are capable of passing to a second energy level under an absorption of an electromagnetic wave; and

a counting unit configured to count said electrons in the second energy level,

wherein the stack of layers of semiconductor materials furthermore comprises a transfer barrier layer, and an electron storage layer separated from the quantum well by the transfer barrier layer, and

wherein a thickness of the transfer barrier layer is [about] at least one order of magnitude greater than a thickness of the quantum well, a lowest energy level of a conduction band of the transfer barrier layer is greater than energy levels of the quantum well and the electron storage layer, and the conduction band profile of the stack of layers of semiconductor materials decreases from the quantum well to the electron storage layer so as to further a flow of electrons from the second energy level to the electron storage layer.